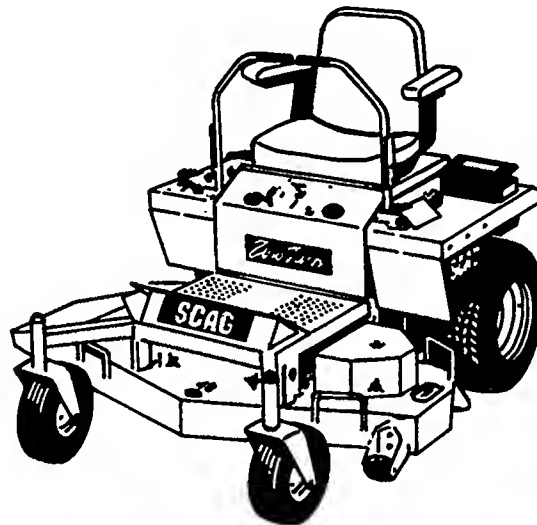




HYDROSTATIC DRIVE COMMERCIAL MOWERS TECHNICAL MANUAL



MODELS

SSZ-16BV
SSZ-18BV
SSZ-18KH

SMZ-48

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Your mower was built to the highest standards in the industry. However, your mower is only as safe as you, the operator, make it. Carelessness or error on the part of the operator may result in serious bodily injury. Hazard control and accident prevention depend upon the awareness, concern, prudence, and proper training of the personnel involved in the operation, transport, and storage of this equipment. Make sure every operator is properly trained and thoroughly familiar with all of the controls and safety instructions before operating the equipment.

SAFETY INSTRUCTIONS

⚠ WARNING

WARNING: Do not operate mower on steep slopes. Riding lawn mowers can tip over when used on an excessive slope. To check a slope, attempt to back up with cutter deck down. If wheels slip when backing up slope, stay off the slope. If you are in doubt about hillside operation, stay off the slope.

Always back up when loading machine on ramps or tilt bed trailers.

1. Know the controls and how to stop quickly. **READ THIS TECHNICAL MANUAL** and instructions furnished with attachments. To order a replacement manual, send complete model and serial number to:

**SCAG Power Equipment, Inc.
1000 Metalcraft Drive
Mayville, WI 53050**
2. Do not allow children to operate the machine. Do not allow adults to operate the machine without proper instruction.
3. Do not carry passengers. Never mow toward or near anyone while mower is operating.
4. Clear the area of objects such as wires, sticks, and rocks that can injure others if picked up and thrown by mower blades.
5. Disengage all attachment clutches and engage parking brake before attempting to start the engine.
6. Disengage all attachment clutches and engage parking brake before leaving the operator's position.
7. Disengage power to attachments, stop engine and remove key before making any repairs or adjustments.
8. Disengage power to attachments when transporting machine or when machine is not being used.
9. Take all possible precautions when leaving machine unattended such as disengaging power to attachments, lowering the attachments, setting the parking brake, and removing the key.
10. Do not stop or start suddenly when going up or down hill. Mow up and down the face of steep slopes; never mow across steep slopes.
11. Reduce speed and be very careful when operating on slopes or making sharp turns to prevent tipping or loss of control. Be especially cautious when changing direction on slopes. If necessary to turn on a hill, always turn downhill.
12. Watch for holes, rocks, roots in the terrain, and other hidden hazards. Keep away from drop-offs.
13. Be careful when pulling loads or using heavy equipment.
 - a. Use only approved drawbar hitch points.
 - b. Limit loads to those you can safely control.
 - c. Do not turn sharply. Use care when backing.
 - d. Use counterweights or wheel weights when suggested in this technical manual.

SAFETY INSTRUCTIONS CONT'D

14. Watch for traffic when crossing roadways or operating near roadways.
15. When using any attachments, never directly discharge materials towards bystanders nor allow anyone near mower while it is operating.
16. Handle gasoline with care – it is highly flammable.
 - a. Use approved gasoline container.
 - b. Never remove fuel cap while engine is running or hot. Allow engine to cool for several minutes before removing cap and adding gasoline. Never fill fuel tank indoors. Always clean up spilled gasoline.
 - c. Do not run the engine indoors.
17. Keep machine and attachments in good operating condition. Make sure safety devices and shields are in place and operate equipment as intended.
18. Keep all nuts, bolts, and screws tight to be sure equipment is in safe operating condition.
19. Never store the equipment with gasoline in the tank inside a building where fumes may reach an open flame or spark. Allow the engine to cool before storing in any enclosure.
20. To reduce fire hazard, keep engine free of grass, leaves, or excess lubricants.
21. If machine or attachments strike a foreign object, disengage power to attachments and stop engine immediately. Wait for moving parts to stop; then inspect for damage. Repair damage before restarting or operating equipment.
22. Do not change engine governor settings or overspeed engine.
23. When using machine with a mower:
 - a. Mow only in daylight or good artificial light.
 - b. Never make a cutting height adjustment while engine is running if the operator must dismount to do so.
 - c. Shut engine off and remove key before removing grass catcher or unclogging chute.
 - d. Check blade mounting bolts for proper tightness at frequent intervals.
24. Under normal usage, the grass catcher bag material is subject to deterioration and wear. Check bag frequently for deterioration and wear, and replace worn bags. Check that replacement bags comply with the original manufacturer's recommendations or specifications.
25. Disengage power to mower before backing up. Do not mow in reverse unless absolutely necessary and then only after careful observation of the entire area behind the mower.
26. The discharge chute must be installed and be in the down position on a side discharge mower except when optional grass catcher or mulching plate is completely installed. If mower discharge plugs, shut engine off, remove key, and wait for all movement to stop before removing obstruction.

SAFETY INSTRUCTIONS CONT'D

27. Perform only the maintenance described in this manual. If additional maintenance or major repairs are needed, contact an Authorized SCAG Servicing Dealer. To ensure optimum performance and safety, always purchase genuine SCAG replacement parts and accessories. NEVER USE "WILL FIT" replacement parts and accessories made by another manufacturer. Using such parts may void the warranty.

⚠ WARNING

WARNING: Do not operate machine while wearing sandals, tennis shoes, sneakers or shorts. Also, do not wear loose fitting clothing which could get caught in moving parts. Always wear long pants and substantial shoes. Wearing safety glasses and safety shoes is advisable.

HYDRAULIC SAFETY

- Safely relieve all pressure in system before disconnecting lines or working on system.
- Keep body and hands away from pin holes or nozzles that eject fluid under high pressure. Use paper or cardboard, not hands, to search for leaks.
- Hydraulic fluid escaping under high pressure may have sufficient force to penetrate skin and cause serious injury. If fluid is injected into skin, a physician familiar with this form of injury must remove it surgically within a few hours or gangrene may result.
- Make sure all hydraulic fluid connections are tight and all hoses and lines are in good condition before applying pressure to the system.

SETUP INSTRUCTIONS

1. Remove all crating and packing materials. Lay out loose mounting hardware according to "Where Used" as listed in the loose parts packing list.

⚠ WARNING

WARNING: Severe chemical burns can result from improper handling of battery electrolyte. Use proper protection to prevent contact with eyes, skin, and clothing.

External contact: Flush with water.

Internal contact: Drink large quantities of water followed with milk of magnesia, beaten eggs, or vegetable oil. CALL A PHYSICIAN IMMEDIATELY.

IMPORTANT - In case of internal contact, DO NOT give fluids that would induce vomiting.

Eye contact: Flush with water at least 15 minutes and get medical attention immediately!

⚠ WARNING

WARNING: Explosive gases vented from a battery during charging or discharging can explode if exposed to flame or spark.

⚠ WARNING

WARNING: Be sure to connect positive (+) lead of charger to positive (+) terminal of battery and negative (-) lead to negative (-) terminal. Reversed connections can cause sparks and unsafe conditions. Make positive (+) connection first, negative (-) connection last.

SETUP INSTRUCTIONS CONT'D

2. Remove battery from unit.

- Fill with electrolyte solution
- Charge at 3 to 5 amps for about two hours.
- Check fluid level. If necessary, add electrolyte until level is up to the bottom of the split ring.

NOTE: Use distilled water if you must add fluid after initial fill with electrolyte.

3. Wash and dry off battery. Coat terminals with grease to minimize corrosion.

4. Mount drive tires using lug nuts on the hubs. Make sure the air valve is facing outward and the tapered edge of the lug nuts are contacting the rim.

5. Attach the seat assembly to the seat base using four 5/16-18 x 3/4" bolts and 5/16" lock washers. (See Figure 1)

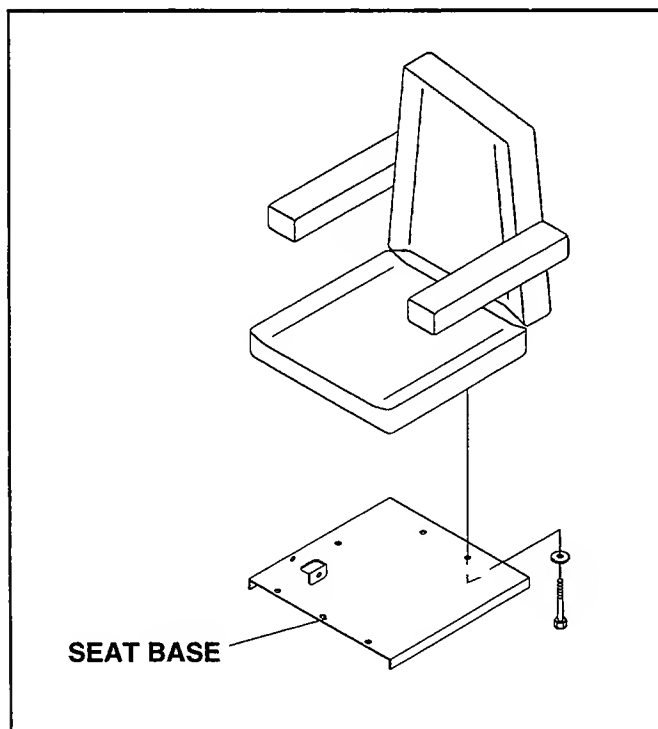


Figure 1

6. Mount RH and LH hand control handles to the control lever bars and secure using four 3/8-16 x 1" bolts, 3/8" lockwashers and 3/8" flatwashers. Slotted holes in the control handles allow position of the handles to be adjusted.

⚠ WARNING

WARNING: To prevent personal injury or equipment damage, do not operate machine without cutter deck properly mounted.

7. Check that cutter deck push arms are set for same distance. The distance should be approximately 15-1/8" from center of bushing to center of ball joint. The distance for both push arms **must** be the same. (See Figure 2)

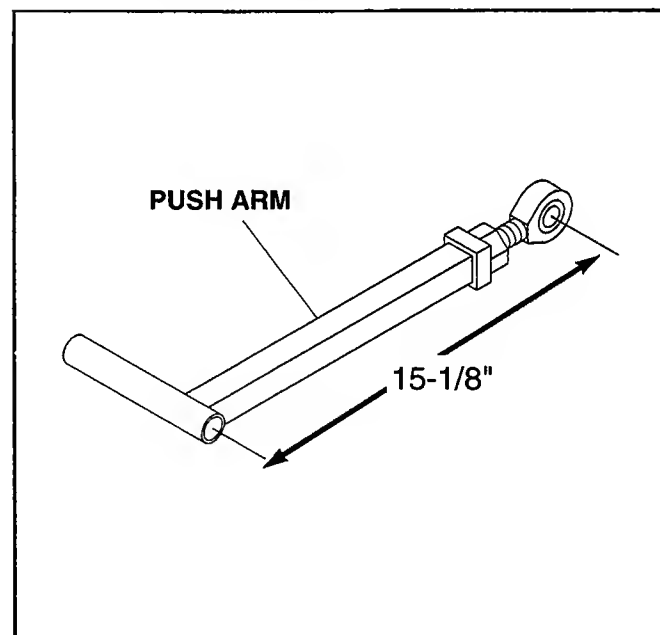


Figure 2

8. Lift or block front of mower, and roll cutter deck underneath cutter deck mounting frame.

SETUP INSTRUCTIONS CONT'D

9. Remove shaft from deck mounting bracket. Line up holes in deck mounting bracket with holes in push arm. Attach cutter deck to push arms by sliding shaft through holes after aligning. (See Figure 3) Secure with existing 5/16-18 x 1" hex head bolt, 5/16" lockwasher, and 5/16" hex nut.

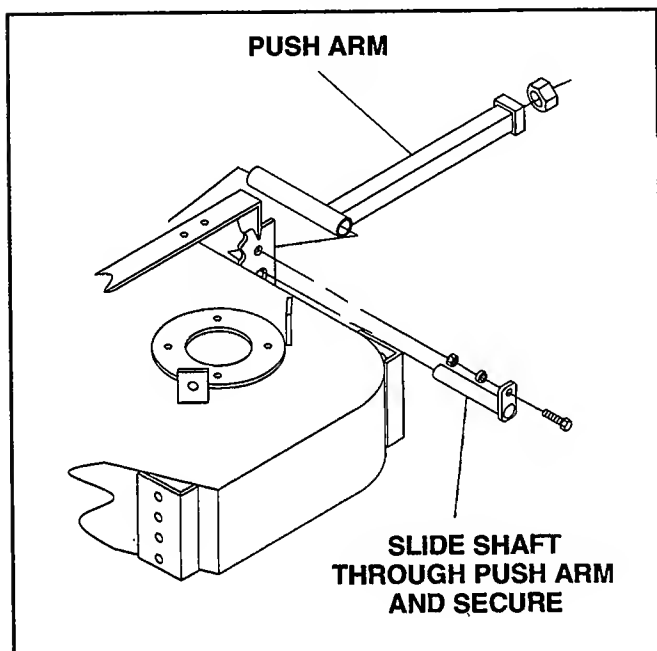


Figure 3

10. Before adjusting deck height (step 11), check tire pressures. (See Figure 4) Correct pressure of drive tires is 12-14 psi. Pressure for caster tires is 25 psi. Make sure pressure for each set of tires is the same.

⚠ WARNING

WARNING: Blade is sharp! Blade at rest can cause severe cuts. Rotating blade can cut fingers off. Always lift deck using handles provided.

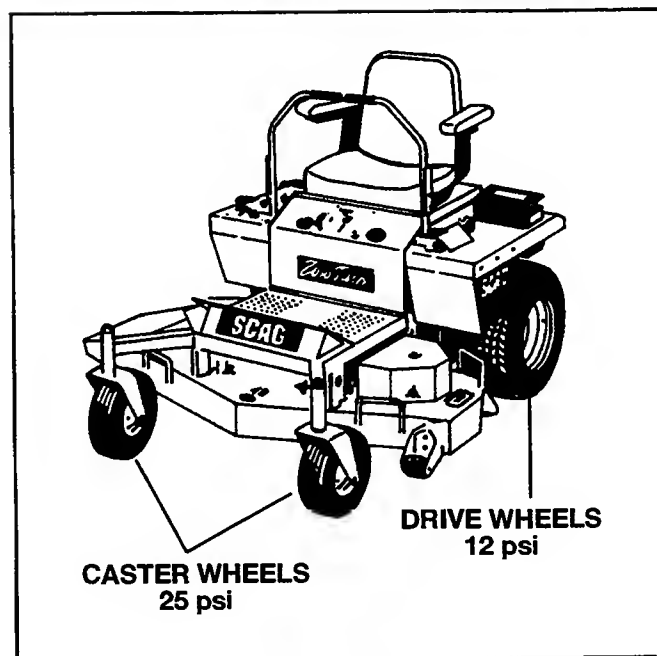


Figure 4

11. Using lift handles at deck corners (See Figure 5), lift deck to desired cutting height. Place pins in appropriate hole on deck U-bracket. Insert hair pins.

IMPORTANT: All pins should be in corresponding holes on deck U-brackets.

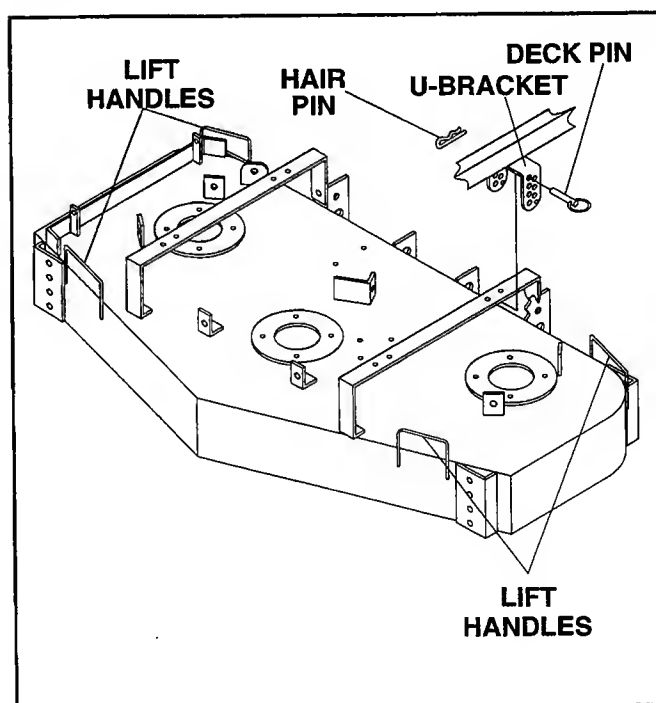


Figure 5

SETUP INSTRUCTIONS CONT'D

12. With unit on a flat, level surface, relocate anti-scalp wheels to lowest position possible. They should be just above the surface without making contact.

IMPORTANT: Be sure deck position is set to the cutting height you will use most. Changing deck position also changes belt tension.

13. Install mower drive belt around engine drive pulley (electric clutch), the center spindle, the idler, and then the left hand spindle. (See Figure 6) Adjust tension by turning nut to end of bracket. (See Figure 12, page 9) Install RH drive belt. Adjust tension by tightening J-Hook. (See Figure 13, page 9)

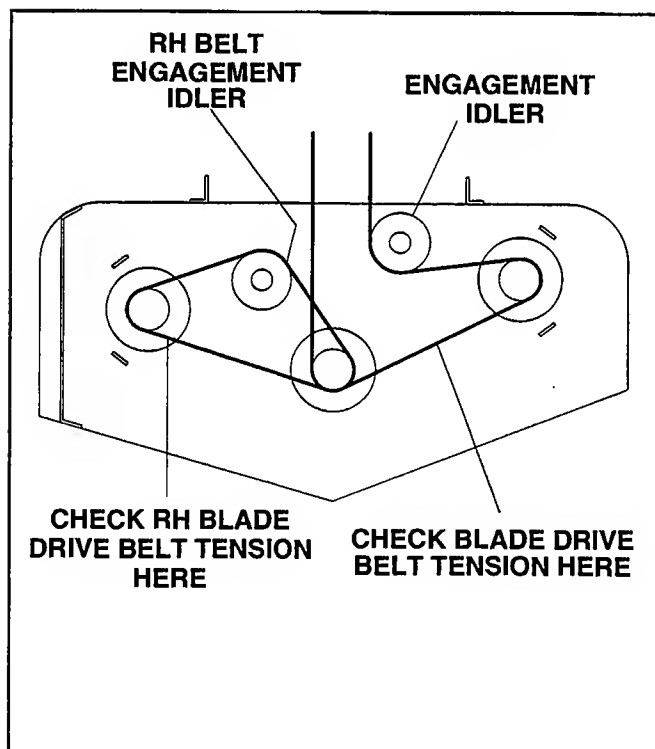


Figure 6

14. Attach discharge chute to cutter deck using two 5/16-18 X 1" bolts and elastic stop nuts. Tighten only enough to remove excessive end play. Discharge chute must be free to move up and down.

IMPORTANT: When installing battery, always connect positive cable first!

15. Install charged battery into battery support. Connect positive cable to positive terminal, and cover with boot. Then attach negative cable. Install battery cover.

NOTE: Engine was shipped without oil. Before you fill engine crankcase, some oil residue may appear on dipstick due to factory testing of assembled engine.

16. Fill engine crankcase with 30 weight oil to FULL mark on engine dipstick (2 quarts for Kohler engines; 1-1/2 quarts for Briggs Vanguard engines). **Do not overfill!**

NOTE: Hydrostatic oil reservoir was shipped without oil.

17. Fill hydrostatic oil reservoir with SAE 20W50 motor oil to 2 inches below top of tank. Approximately 4 quarts will be needed. **Do not overfill!**

18. Check machine to make sure all bolts are properly tightened.

WARNING

WARNING: Gasoline is highly flammable. Be careful when filling tank. Do not fill tank while engine is running or hot from operation. Extinguish open flames, matches, and smoking materials before filling tank. Do not overfill tank. Wipe up all gasoline spills. Use appropriate container.

19. Fill fuel tank with gasoline.

20. Open shutoff valve under tank. Check for fuel leaks.

ADJUSTMENTS

Safety Instructions

CAUTION

1. Stop engine and remove key from ignition before making any adjustments. Wait for all moving parts to come to a complete stop before beginning work.
2. Engine and drive unit can get hot during operation. Allow engine and drive components to cool before making any adjustments.
3. Keep hands and body away from pin holes or nozzles that eject hydraulic fluid under high pressure. Hydraulic fluid escaping under high pressure may have sufficient force to penetrate skin and cause serious injury requiring immediate medical attention. Relieve all pressure in hydraulic system before disconnecting lines or making adjustments.

Neutral Adjustment

1. Set frame up on jack stands so drive wheels are free to rotate. Block caster wheels to prevent an accident if unit should accidentally fall off jack stands.
2. Move dump valve lever, on LH side of mower, behind hook on frame to close hydraulic dump valves on pump. (See Figure 7) Pull lever back and to the left, then push forward to relieve pressure.

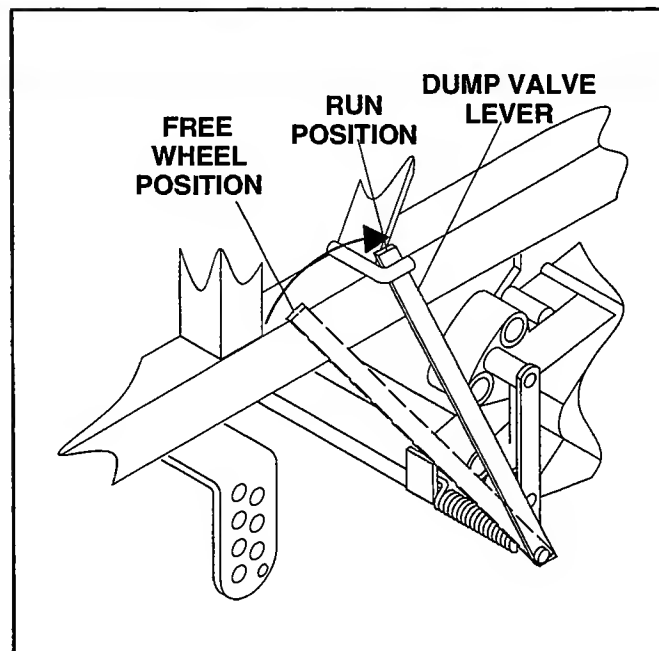


Figure 7

3. Start engine, and check if one or both drive wheels are turning.
4. Adjust each drive wheel separately by using the turnbuckles. Loosen jam nut on turnbuckle. (See Figure 8)

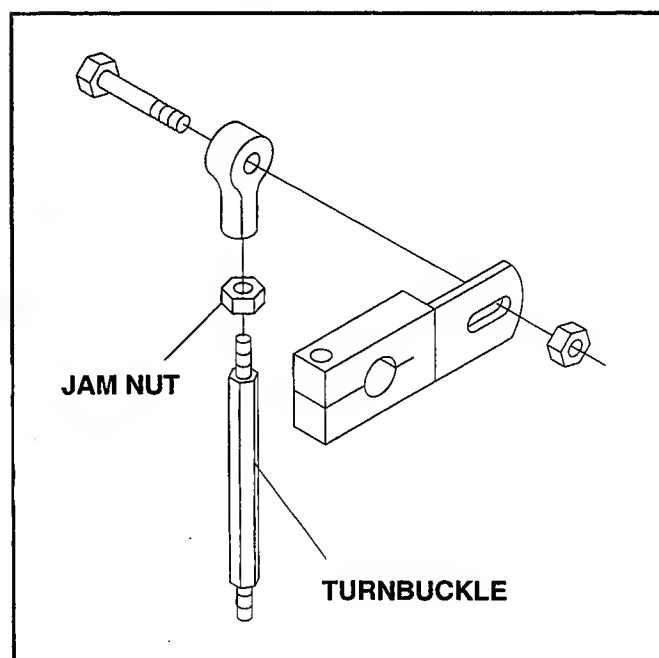


Figure 8

ADJUSTMENTS CONTINUED

5. If drive wheel is rotating forward, adjust turnbuckle clockwise. If drive wheel is rotating rearward, adjust turnbuckle counterclockwise. Adjust until drive wheel stops turning. (See Figure 9)

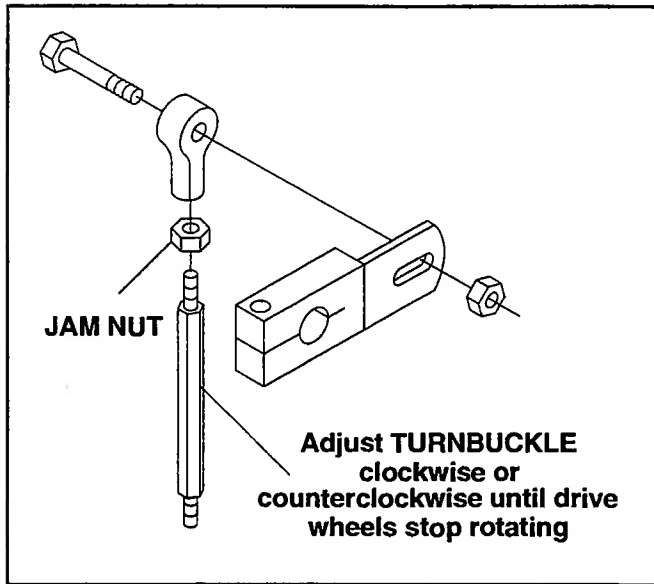


Figure 9

6. Tighten jam nut to secure neutral position.
7. Adjust other drive wheel if necessary.
8. Actuate hand control levers forward and reverse. Allow levers to self-center and check that drive wheels remain in neutral.

NOTE: Neutral return mechanisms on the fenders are adjusted at the factory. Readjustment should not be necessary.

Straight Line Running Adjustment

1. Before making this adjustment, check tire pressure of drive wheels. Tire pressure for each wheel must be equal. (See Figure 4) If tire pressures are not equal, machine will pull to the side with the lower tire pressure.

NOTE: Make this adjustment only on LH pump. RH pump has a fixed speed and cannot be adjusted.

2. Locate turnbuckle for LH pump under the operator seat in front of the hydraulic oil tank. (See Figure 10)

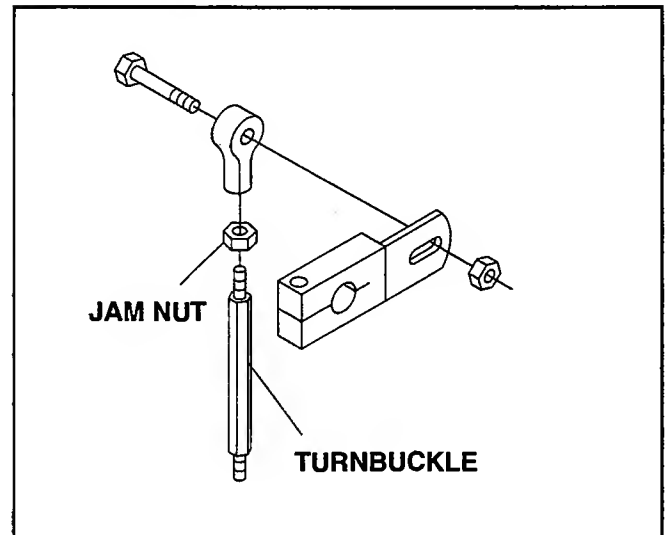


Figure 10

3. Loosen nut securing turnbuckle to bellcrank. (See Figure 11)

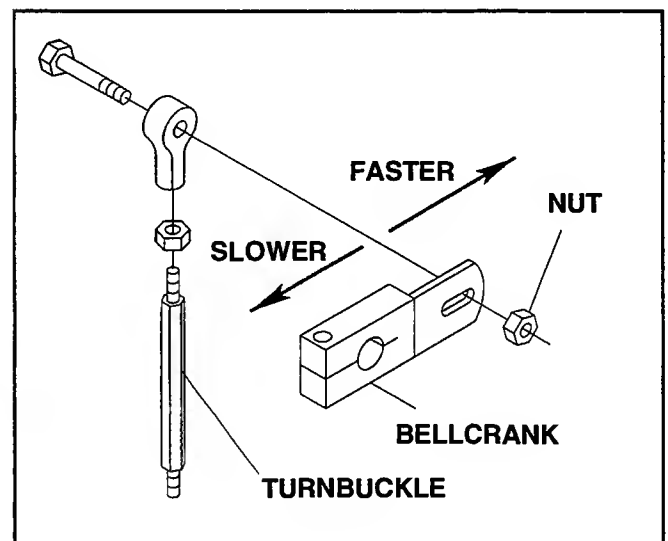


Figure 11

ADJUSTMENTS CONTINUED

4. Adjust position of turnbuckle by moving it in mounting slot either forward to slow left wheel or backward to speed up left wheel. If unit pulls to the right, left wheel is too fast. If unit pulls to the left, left wheel is too slow.
5. Tighten nut to secure turnbuckle.
6. Readjust neutral if necessary.

Cutter Deck Drive Belts

1. Remove belt covers.

CAUTION

CAUTION: Stop engine and remove key from ignition before making any adjustments. Wait for all moving parts to come to a complete stop before beginning work.

2. Adjust LH belt tension by tightening idler so that belt moves 1/2" with 10 pounds pressure. Adjust nut to end of L-shaped bracket. (See Figure 12)

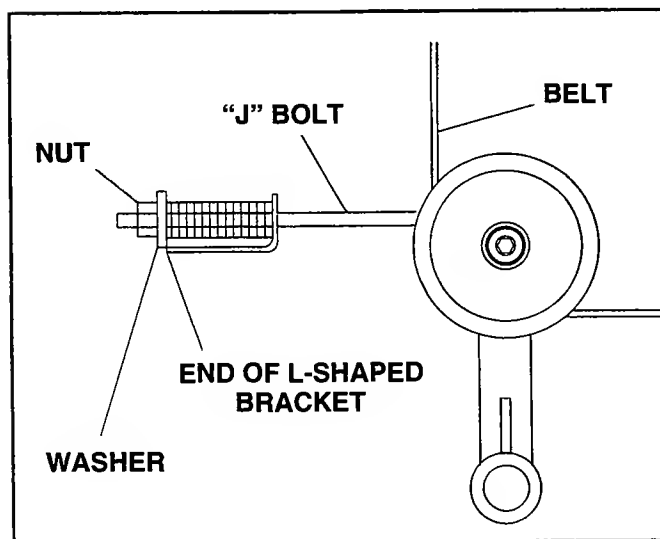


Figure 12

3. Adjust RH belt tension so belt moves 1/2" with 10 pounds pressure. Adjust tension by tightening or loosening J-bolt. (See Figure 13)
4. Replace belt covers.

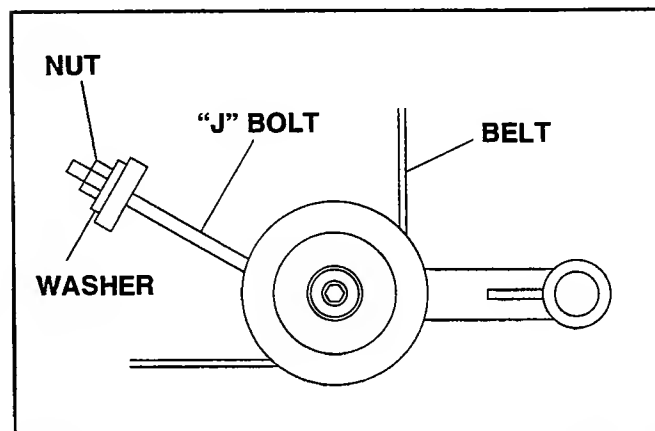


Figure 13

Parking Brake

To engage parking brake, move lever up and out into bracket. To disengage parking brake, pull lever up and in, away from bracket. (See Figure 14)

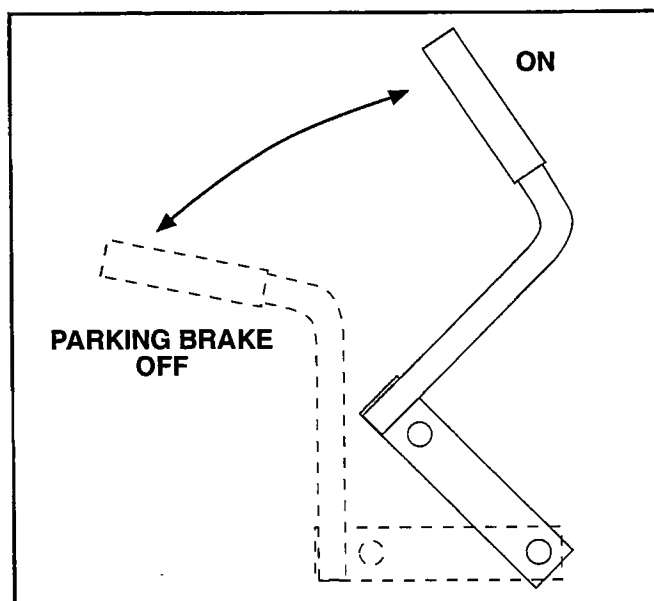


Figure 14

ADJUSTMENTS CONTINUED

Transmission Drive Belt Tension

CAUTION

CAUTION: Stop engine and remove key from ignition before making any adjustments. Wait for all moving parts to come to a complete stop before beginning work.

Lift seat up. Adjust belt tension by tightening or loosening nut on J-hook connected to transmission drive idler. (See Figure 15) Under proper tension, belt should move 1/4" with 10 pounds pressure.

IMPORTANT:

- If drive belt is too tight, pump or belt are likely to fail.
- If drive belt is too loose, left hand pump pulley will slip, causing left side to be slower than right side.

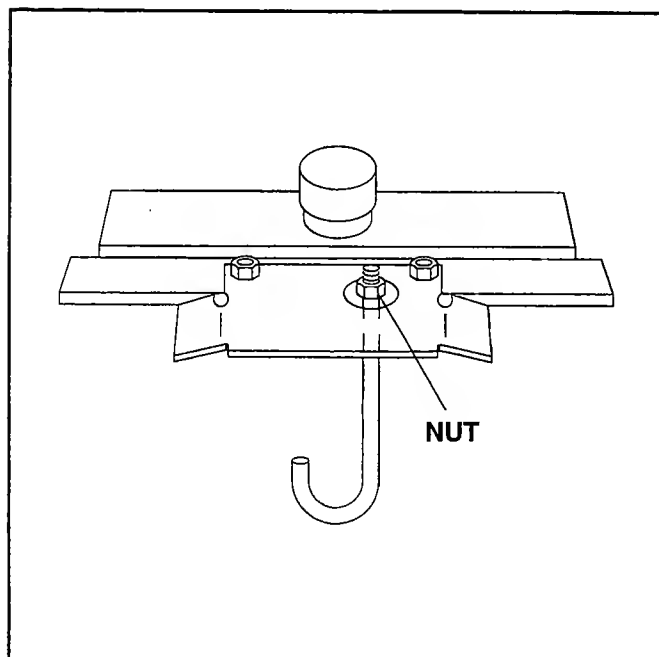


Figure 15

Hand Control Handle Position

The position of the hand control handles can be adjusted for operator comfort. Loosen the bolts holding the handle to the lever bar just enough to allow movement of the handle. Adjust to position most comfortable for operator. Retighten bolts.

INITIAL RUN, INSPECTION AND OPERATING INSTRUCTIONS

1. Check that all belts are routed correctly.
2. Check cutter blade drive belts for correct alignment and tension.
3. Make sure engine oil level is at FULL on dipstick.
4. Check oil level in hydraulic reservoir. Reservoir is under seat. Oil level should be 2" below top of tank.
5. Check that all fasteners are tightened properly. Make sure all safety devices are in place and working correctly.

WARNING

WARNING: Gasoline is highly flammable. Be careful when filling tank. Do not fill tank while engine is running or hot from operation. Extinguish open flames, matches, and smoking materials before filling tank. Do not overfill tank. Wipe up all gasoline spills.

6. Fill fuel tank with clean, fresh, lead-free gasoline.

ADJUSTMENTS CONTINUED

7. Check safety interlock system. With operator on seat, engine must not start unless control handles are in neutral lock position and cutter drive is disengaged.

IMPORTANT: If engine is running, engine must stop if operator leaves seat, when one or both handles are in drive position, or cutter drive is engaged.

8. To start engine:
 - a. Place control handles in neutral lock position.
 - b. Pull mower engagement switch to off position.
 - c. Put parking brake in engaged position.
 - d. Adjust throttle and choke as required.
 - e. Turn ignition key to start.

Release ignition key when engine starts. Key will return to RUN position.

9. Pull mower engagement switch out and push forward to engage cutter drive belts. (See **Figure 16**) Allow belts to run for five minutes.

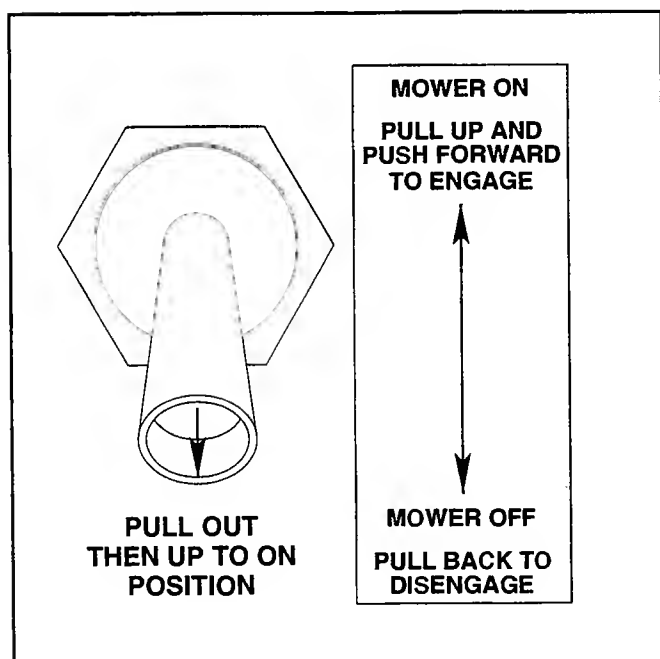


Figure 16

10. Release parking brake. Check that machine does not creep forward or backward. If machine does creep, adjust neutral control. See "Neutral Adjustment" instructions.
11. Operate unit forward and backward. Check that all systems function correctly. If machine does not move, make sure hydraulic dump valve lever near left wheel is engaged.
12. Shut off engine, remove key from ignition, and wait for all moving parts to stop. Recheck cutter deck drive belts for proper tension. Correct and adjust as necessary.
13. Park machine on level area, set parking brake, and remove key from ignition to prevent engine starting.

MAINTENANCE

Free Wheeling

To release drive wheel so machine will roll without engine running, pull dump valve lever for hydraulic dump valve back from hook on frame. Move to left and push forward to relieve pressure. Lever is on LH side of mower. (See **Figure 7** on page 7)

MAINTENANCE CONTINUED

Cutter Blades

CAUTION

CAUTION: Sharp blade can cut fingers or hand. Always wear heavy-duty gloves when working with blade.

Sharpen blades as shown on Figures 17 and 18.

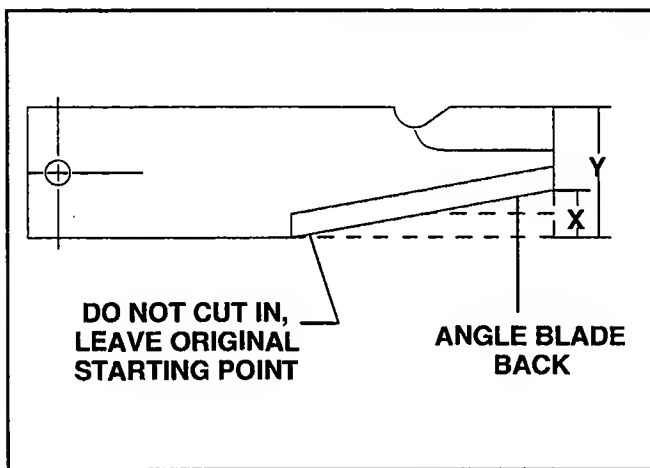


Figure 17

Do not sharpen (X) beyond 1/3 of blade width (Y).

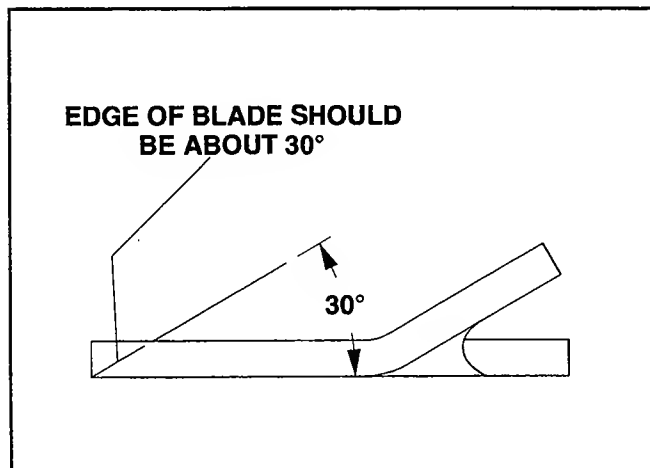


Figure 18

Suggestion: Dress blade with a file. Wheel grinder may burn the blade.

Curb Climbing

When driving a riding mower up and over a curb, drive in reverse and at an angle so that back drive wheels go over curb one at a time. When both drive wheels are over curb, turn machine so that both front caster wheels contact curb at the same time. (See Figure 19)

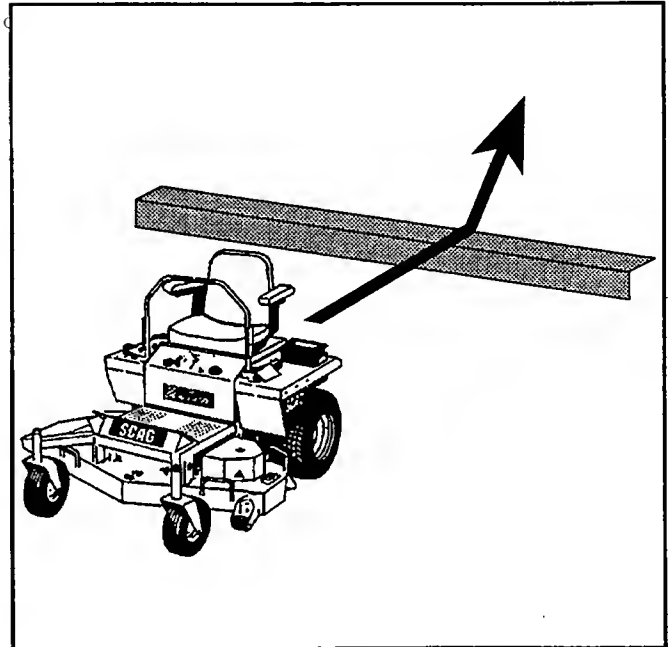


Figure 19

LUBRICATION & MAINTENANCE

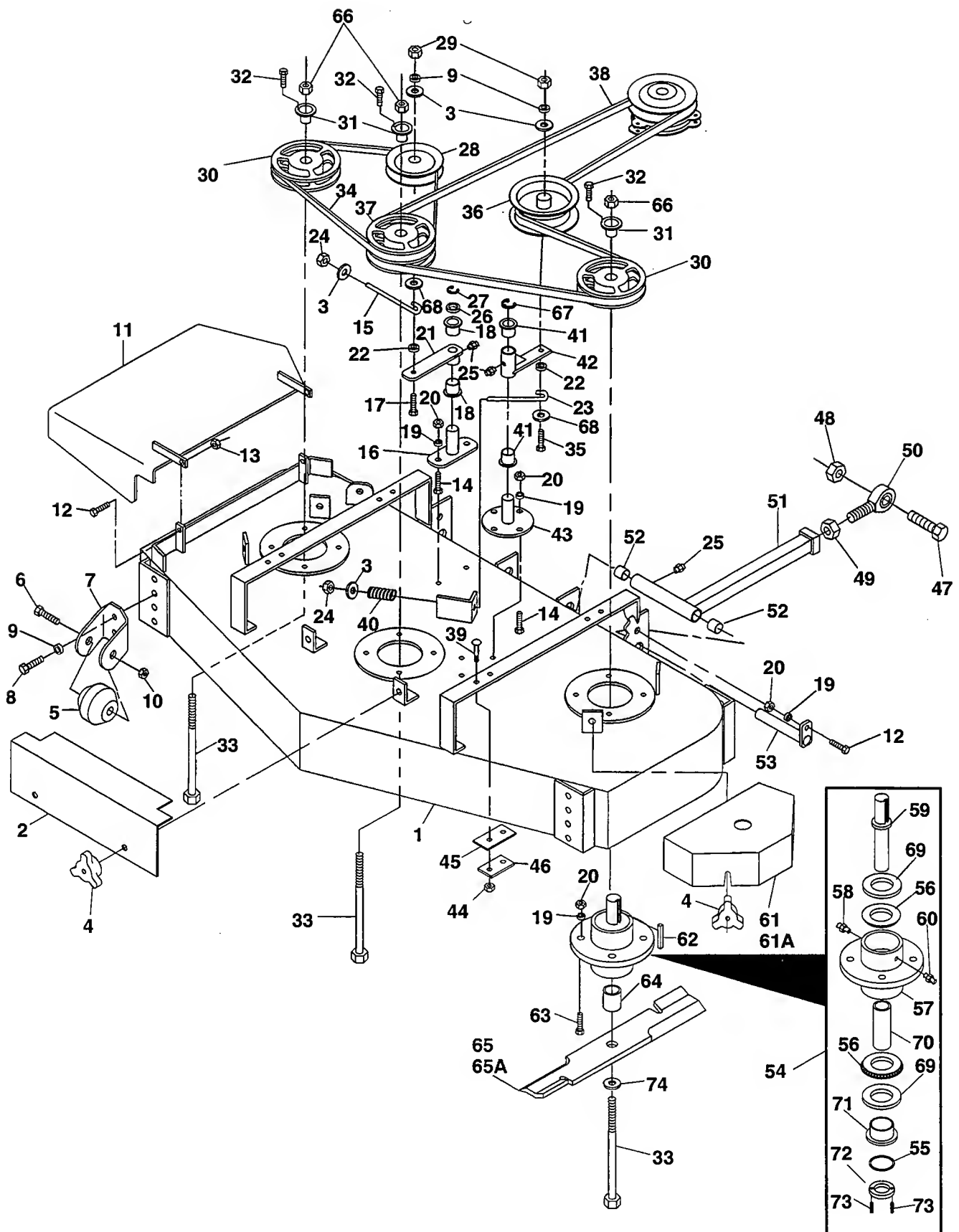
Break-In			
8 hours (Daily)			
40 hours (Weekly)			
100 hours (Biweekly)			
200 hours (Monthly)			
		Procedure	Comments
X	X	Check all hardware for proper tightness Change engine oil and filter at 5 hours	See engine manufacturer information
X	X	Check engine oil level Clean hydraulic pump cooling fins Remove debris from under belt cover Sharpen cutter blades Grease spindle bearings (2 pumps of hand gun) Clean air filter	Do not overfill MORE OFTEN IF NEEDED MORE OFTEN IF NEEDED MORE OFTEN IF NEEDED + US Lithium MP White Grease 2125 MORE OFTEN IF NEEDED
X	X	Check battery acid level Check tire pressure Change engine oil Check belt tension	Use distilled water only Add air if necessary See engine manufacturer information Adjust as needed
X	X	Replace air filter Grease caster wheel bearings Grease caster wheel pivots Grease idler arm pivots Grease push arms Grease control levers	MORE OFTEN IF NEEDED Chassis grease - Qty 2 Chassis grease - Qty 2 Chassis grease - Qty 3 Chassis grease - Qty 2 Chassis grease - Qty 2
X	X	Check all hardware for proper tightness Change engine oil filter Check hydro fluid reservoir level Clean and adjust spark plugs	See engine manufacturer information Add oil if needed (SAE 20W50) See engine manufacturer information
		Every 500 hours (Bimonthly) Drain hydraulic system and replace fluid Change hydrostatic oil filter * Adjust air gap on electric clutch	Use SAE 20W50 motor oil Clean area before removing filter Contact your Scag dealer for information about making this adjustment

*** IMPORTANT: Use only Scag Authorized part for proper filtration.**

+ Compatible Greases:

- Lidok EP #2 (found at industrial shops)
- Ronex MP (Exxon service stations)
- Shell Alvania (Shell service stations)
- Mobilux #2 (Mobil service stations)
- Super Lube M EP #2 and Super Lube-M #2 (Conoco service stations)

CUTTER DECK

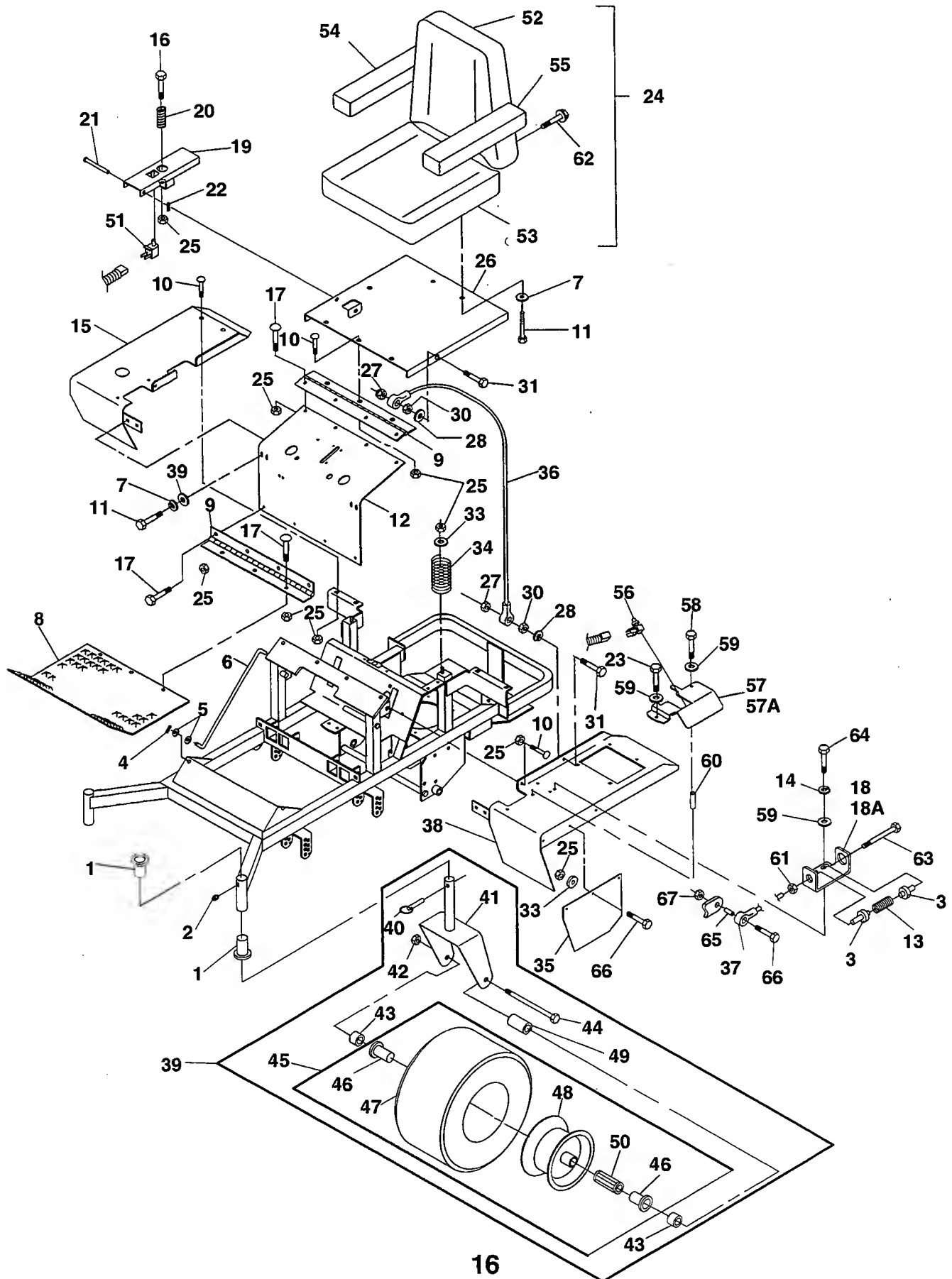


CUTTER DECK

Ref. No.	Part Number	Description	Ref. No.	Part Number	Description
1	46478	Cutter Deck (Includes decals)	40	48807	Spring, Idler Tension
2	421058	Belt Cover, Front	41	48100-02	Bushing
3	*	Flatwasher, 3/8"	42	46479	Idler Arm (Includes bushings & grease fitting)
4	04029-03	Wing Nut, 3/8-16	43	45329	Idler Pivot Base
5	48584	Anti-Scalp Wheel	44	*	Elastic Stop Nut, 1/4-20
6	*	Hex Head Bolt, 5/8-11 x 4-1/2"	45	48817	Rubber Pad
7	42862	Anti-Scalp Wheel Bracket	46	421232	Back-up Plate
8	*	Hex Head Bolt, 3/8-16 x 1"	47	*	Hex Head Bolt, 5/8-11 x 3"
9	*	Lockwasher, 3/8"	48	*	Elastic Stop Nut, 5/8-11
10	*	Hex Nut, 5/8-11 Elastic Stop	49	*	Hex Nut, 5/8-18 UNF
11	45331	Discharge Chute	50	48763	Rod End
12	*	Hex Head Bolt, 5/16-18 x 1"	51	46460	Push Arm (Includes 25,49,50 & 52)
13	*	Hex Nut, 5/16-18 Elastic Stop	52	48100-06	Bushing
14	*	Hex Head Bolt, 5/16-18 x 3/4"	53	45332	Push Arm Shaft
15	44078	"J" Rod	54	46400	Cutter Spindle Assembly (Complete, Tapered)
16	45037	Idler Pivot Base	55	04060-04	Retaining Ring, 1" External, Inverted
17	*	Hex Head Bolt, 3/8-16 x 2-1/4"	56	48668	Bearing & Cup, Tapered Spindle
18	48100-05	Bushing	57	41008	Spindle Housing, Tapered Spindle
19	*	Lockwasher, 5/16"	58	48114-02	Grease Fitting
20	*	Hex Nut, 5/16-18	59	45391	Spindle Shaft, Tapered Spindle
21	46081	Idler Arm, (Includes bushings & grease fitting)	60	48667	Relief Fitting, Tapered Spindle
22	43077	Spacer	61	421219	Belt Cover - RH
23	43028	"J" Rod	61A	421218	Belt Cover - LH
24	*	Hex Nut, 3/8-16 Elastic Stop	62	04063-08	Key, 1/4 x 1/4 x 2"
25	48114-04	Grease Fitting	63	*	Hex Head Bolt, 5/16-18 x 1-1/4"
26	04041-08S	Flatwasher, 3/4" Special	64	43235	Spacer-Tapered Spindle
27	04050-02	Retaining Ring, 3/4" External "E"	65	48110	Cutter Blade, 16-1/2" Standard
28	48181	Pulley, Idler	65A	48184	Cutter Blade, 16-1/2" High Lift
29	*	Hex Nut, 3/8-16	66	*	Hex Nut, 5/8-11
30	48127	Pulley (Includes items 31 & 32)	67	04050-05	Retaining Ring 1-1/8" External "E"
31	48141	Tapered Hub	68	04041-12	Flatwasher, 3/8" (3/8 x 1.5 x .06)
32	*	Hex Head Bolt, 1/4-20 x 3/4"	69	48681	Seal, Tapered Cutter Spindle
33	04001-41	Hex Head Bolt, 5/8-11 x 9-1/2"	70	43218	Spacer, Tapered Spindle
34	48087	Belt, RH Blade Drive	71	43217	Bushing, Tapered Spindle
35	*	Hex Head Bolt, 3/8-16 x 4"	72	43201	1/4" Blade Spacer, Tapered Spindle
36	48550	Pulley, Idler - Cutter Engagement	73	*	Roll Pin, 1/8 x 1/2"
37	48412	Pulley, Double (Includes 31)	74	04010-10	Flatwasher, 5/8" (.688 x 1.75 x .134)
38	48799	Belt, Blade Drive			
39	*	Carriage Head Bolt, 1/4-20 x 1"			

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

SHEET METAL COMPONENTS

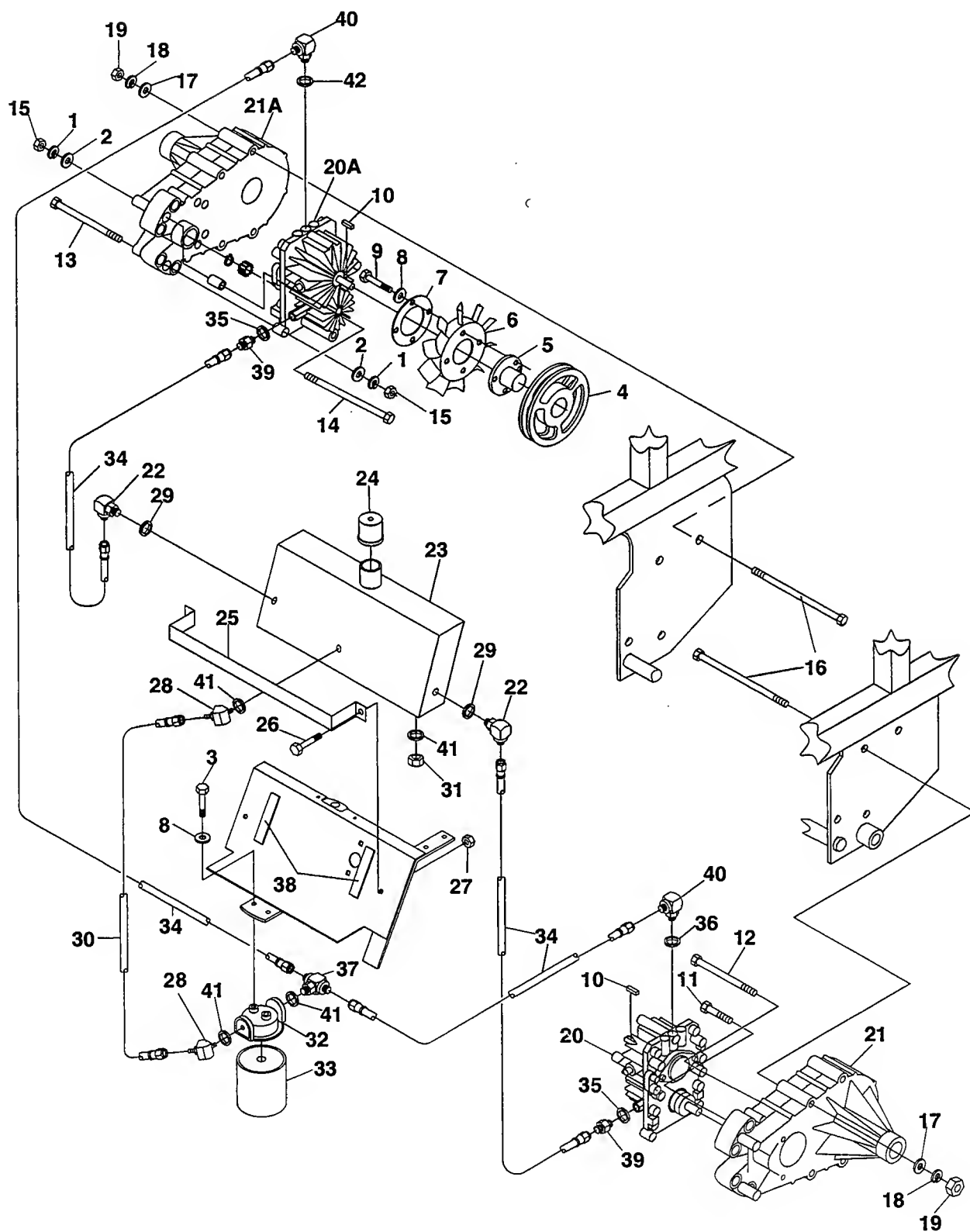


SHEET METAL COMPONENTS

Ref. No.	Part Number	Description	Ref. No.	Part Number	Description
1	48100-08	Bushing	35	421198	Fender Panel, RH
2	48114-04	Grease Fitting	36	48566	Cable, Seat Stop
3	43257	Bushing, Spring Keeper	37	48464	Ball Joint, Neutral
4	04062-02	Hair Pin, 1/16" Diameter	38	45479	Fender - LH
5	*	Flatwasher, 3/8"	39	46392	Caster Wheel Assembly, Complete
6	44062	Rod, Foot Plate Latch	40	44066-01	Quick Pin
7	*	Lockwasher, 5/16"	41	45325	Caster Wheel Yoke
8	42764	Foot Plate	42	*	Hex Nut, 1/2-13 Elastic Stop
9	48547	Hinge	43	43041	Spacer
10	*	Carriage Bolt, 5/16-18 x 3/4"	44	*	Hex Head Bolt, 1/2-13 x 6-1/2"
11	*	Hex Head Bolt, 5/16-18 x 3/4"	45	48537	Wheel Assembly, Complete
12	421251	Kick Plate	46	48006-07	Retainer
13	48746	Neutral Return Spring	47	48537-02	Tire Only
14	*	Lockwasher 3/8", LH Only	48	48537-03	Rim Only
15	46505	Fender Assembly, RH (with decal)	49	43022	Sleeve
16	*	Hex Head Bolt, 5/16-18 x 3-3/4"	50	48006-06	Roller Bearing
17	*	Carriage Bolt, 5/16-18 x 1"	51	48717	Seat Switch
18	421267	Retainer, Neutral Spring, LH	52	48704-02	Seat Back Cushion
18A	421268	Retainer, Neutral Spring, RH	53	48704-03	Seat Bottom Cushion Assembly
19	45405	Seat Switch Bracket	54	48704-04	Arm Pad, RH
20	48463	Spring	55	48704-05	Arm Pad, LH
21	04064-04	Clevis Pin	56	48522	Neutral Interlock Switch
22	04062-02	Hair Pin Cotter	57	421253	Neutral Lock Bracket, RH
23	*	Hex Head Bolt, 5/16-18 x 3/4"	57A	421252	Neutral Lock Bracket, LH
24	48831	Seat	58	*	Hex Head Bolt, 5/16-18 x 2-3/4"
25	*	Hex Nut, 5/16-18 Elastic Stop	59	*	Flatwasher, 5/16"
26	45404	Seat Base	60	43258	Spacer, Neutral Lock Bracket
27	*	Hex Nut, 1/4-20 Elastic Stop	61	*	Hex Nut, 3/8-24 UNF
28	*	Lockwasher, 1/4"	62	48704-06	Hex Head Screw w/Washer, 1/4-20 x 3/4"
29	*	Flatwasher, 1/4"	63	04001-99	Hex Head Bolt, 3/8-24 x 6-1/2", UNF
30	*	Hex Nut, 1/4-20	64	*	Hex Head Bolt, 5/16-18 x 3/4"
31	*	Hex Head Bolt, 1/4-20 x 1"	65	43240	Spacer Neutral Spring
32	*	Hex Head Bolt, 5/16-18 x 1-1/4"	66	*	Hex Head Bolt, 3/8-16 x 2-1/4"
33	*	Flatwasher, 5/16"	67	*	Elastic Stop Nut, 3/8-16
34	48686	Seat Spring			

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

HYDRAULIC COMPONENTS

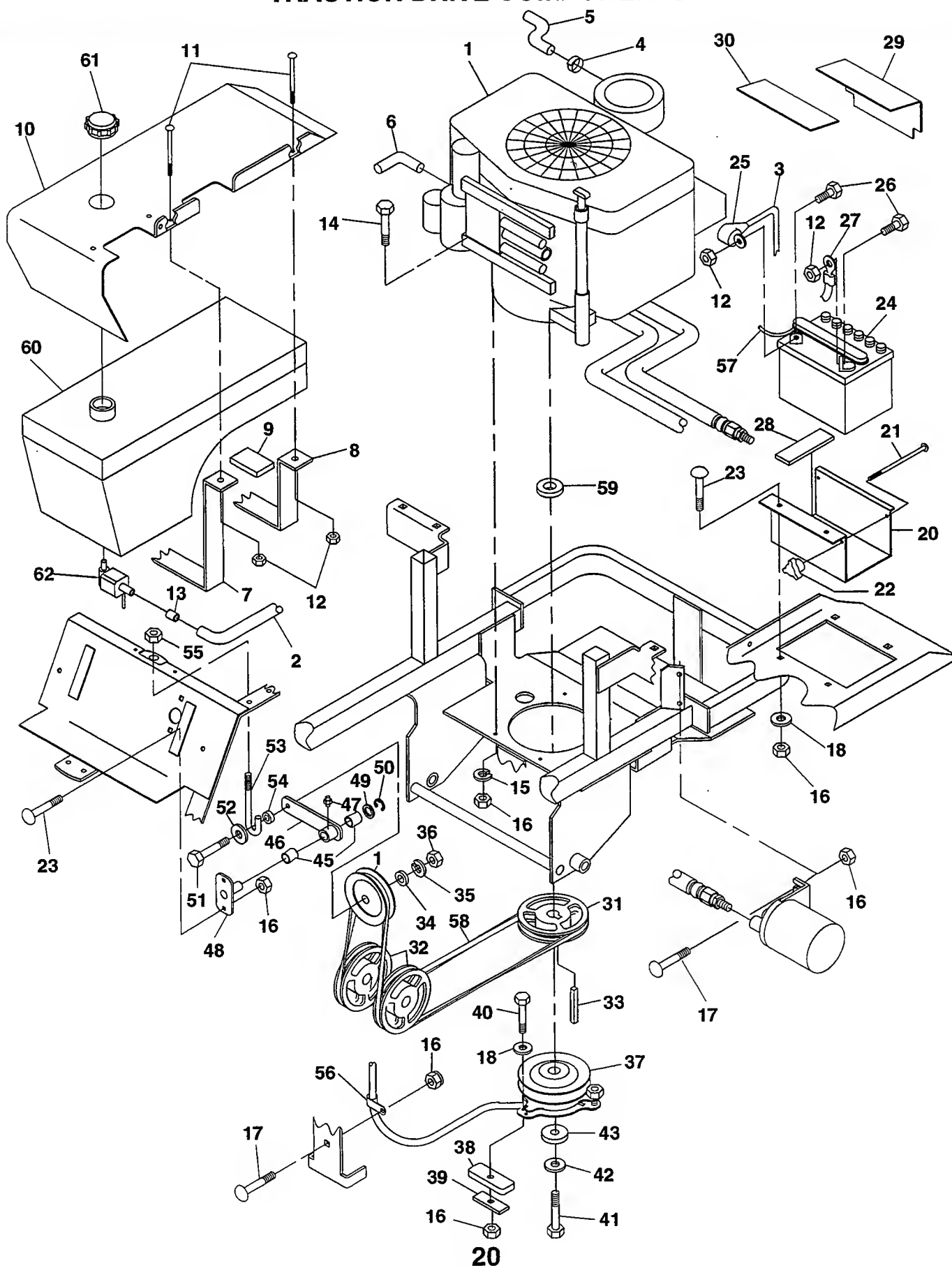


HYDRAULIC COMPONENTS

Ref. No.	Part Number	Description	Ref. No.	Part Number	Description
1	*	Lockwasher, 5/16"	23	45478	Oil Tank Reservoir
2	*	Flatwasher, 5/16"	24	48376	Cap, Oil Reservoir
3	*	Hex Head Bolt, 1/4-20 x 3/4"	25	421208	Oil Reservoir Strap
4	48790	Pump Pulley	26	*	Hex Head Bolt, 1/4-20 x 2"
5	48791	Tapered Hub, 15mm Bore	27	*	Hex Nut, 1/4-20
6	48789	Fan	28	48485-01	45 Degree Elbow, 3/4-16 JIC to 3/4-16 "O" Ring
7	421209	Back-up Washer	29	48603-06	"O" Ring, 5/64 x 15/32 ID
8	*	Lockwasher, 1/4"	30	48872	Hose Assembly, Filter Inlet
9	*	Hex Head Bolt, 1/4-20 x 1/2"	31	48604-02	Plug, 3/4-16 "O" Ring
10	04063-14	Key, 5 x 5 x 25mm	32	48462-02	Head, Oil Filter
11	*	Hex Head Bolt 5/16-18 x 1-3/4"	33	48462-01	Oil Filter, Special
12	04001-96	Hex Head Bolt 5/16-18 x 4-1/2"	34	48871	Hose Assembly
13	04001-95	Hex Head Bolt 5/16-18 x 5"	35	48603-04	"O" Ring, 3/32 x 3/4 ID
14	04001-94	Hex Head Bolt 5/16-18 x 7-1/2"	36	48603-03	"O" Ring, 1/16 x 3/8 ID
15	*	Nut, 5/16-18	37	48810-01	1/2" T-fitting, 3/4-16 JIC to 3/4-16 "O" Ring
16	*	Hex Head Bolt, 3/8-16 x 4"	38	48661	Rubber Pad
17	04041-07	Flatwasher, 3/8"	39	48572-02	Tube Union, 3/4-16 JIC to 7/8-14 "O" Ring
18	*	Lockwasher, 3/8"	40	48350-10	90 Degree Elbow, 9/16-18 JIC to 7/16-20 "O" Ring
19	*	Hex Nut, 3/8-16	41	48603-02	"O" Ring, 3/32 x 5/8 ID
20	48784	Pump, LH (Includes Spacers)			
20A	48785	Pump, RH (Includes Spacers)			
21	48782	Axle, LH, (Includes Brake Lever)			
21A	48783	Axle, RH, (Includes Brake Lever)			
22	48350-09	90 Degree Elbow, 9/16-18 JIC to 9/16 -18"O" Ring			

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

TRACTION DRIVE COMPONENTS



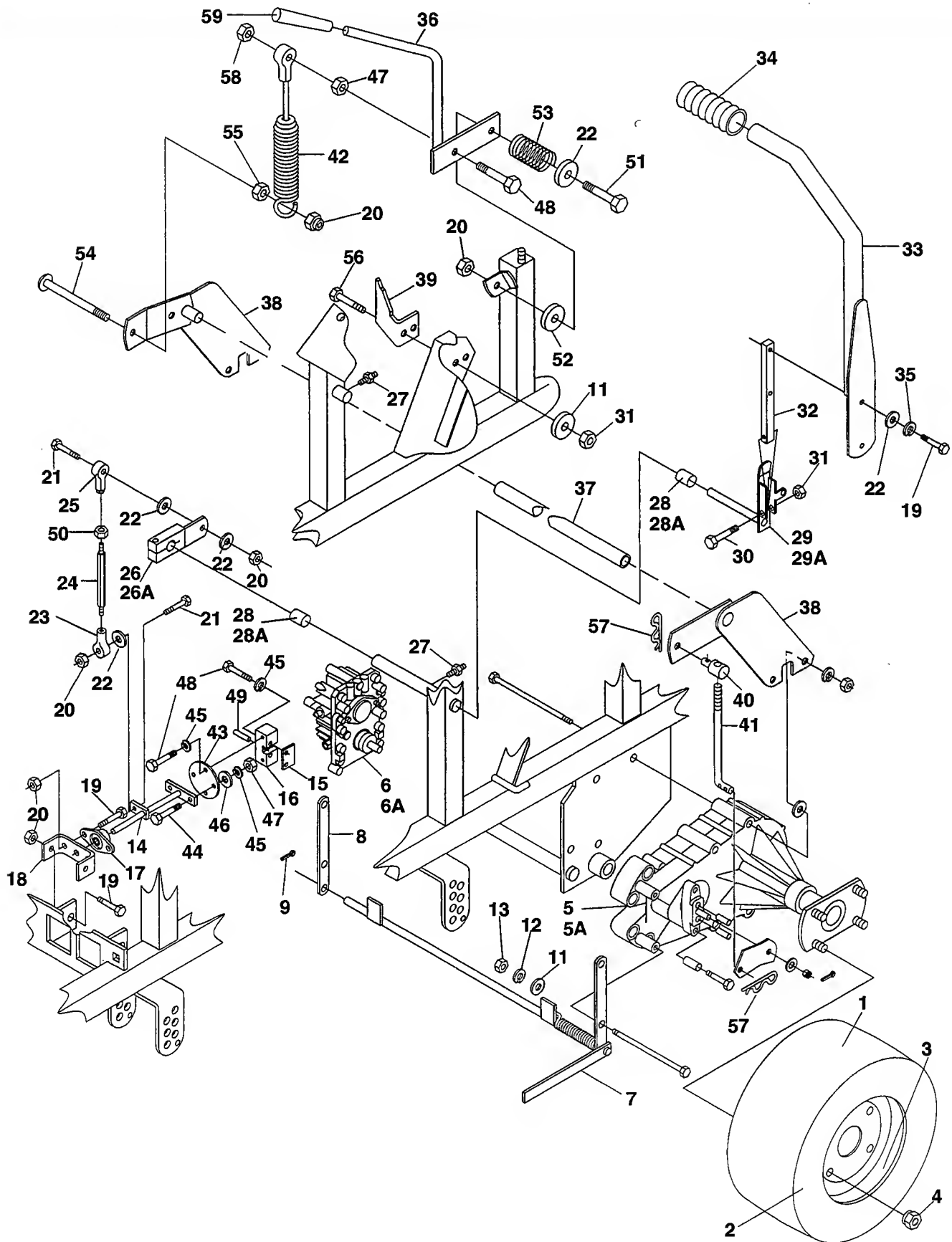
TRACTION DRIVE COMPONENTS

Ref. No.	Part Number	Description	16 BV	18 BV	18 KH
1	48766	Engine	X		
1	48768	Engine		X	
1	48812	Engine			X
2	48058-14	Fuel Hose, 36" Long	X	X	
2	48058-05	Fuel Hose, 20" Long			X
3	48029-06	Battery Cable, 18" Red	X	X	
3	48029-12	Battery Cable, 36" Red			X
4	48633	Muffler Clamp			X
5	48637	Tube, Exhaust			X
6	48600-01	Street Elbow - 3/8 NPT	X	X	X

Ref. No.	Part Number	Description	Ref. No.	Part Number	Description
7	42944	Fuel Tank Strap, Long	36	*	Hex Nut, 3/8-16
8	42945	Fuel Tank Strap, Short	37	48786	Electric Clutch
9	48657	Rubber Pad	38	48814	Rubber Pad, Clutch Stop
10	46505	Fender Assembly, RH (with decal)	39	421215	Backing Plate
11	*	Machine Screw, 1/4-20 x 2"	40	*	Hex Head Bolt, 5/16-18 x 1-1/4"
12	*	Nut, 1/4-20	41	04001-93	Hex Head Bolt, 7/16-20 x 3"
13	48059-01	Fuel Hose Clamp	42	*	Lockwasher, 7/16"
14	*	Hex Head Bolt, 5/16-18 x 1-1/2"	43	04041-18	Flatwasher, 7/16" Special
15	*	Lockwasher, 5/16"	44	48181	Idler Pulley
16	*	Elastic Stop Nut, 5/16-18	45	48100-05	Bushing
17	*	Carriage Bolt, 5/16-18 x 1"	46	46081	Idler Arm (Includes bushings and grease fittings)
18	*	Flatwasher, 5/16"	47	48114-04	Grease Fitting
19	45458	Fender, LH	48	45037	Idler Pivot Base
20	421197	Battery Box	49	04041-08	Flatwasher, 3/4" Special
21	*	Carriage Bolt, 1/4-20 x 6"	50	04050-02	Retaining Ring, 3/4" external "E"
22	04029-01	Wing Nut, 1/4-20	51	*	Hex Head Bolt, 3/8-16 x 2-1/4"
23	*	Carriage Bolt, 5/16-18 x 3/4"	52	04041-12	Flatwasher 3/8 x 1-1/2 x .06
24	48015	Battery	53	44075	"J" Bolt
25	48126	Rubber Boot	54	43077	Spacer
26	*	Hex Head Bolt, 1/4-20 x 3/4"	55	*	Elastic Stop Nut, 3/8-16
27	48029-11	Battery Cable, 27" Black	56	48030-09	Clamp
28	48661	Rubber Pad	57	48015-01	Overflow Tube
29	42392	Battery Cover	58	48760	Belt, Pump Drive
30	48099	Battery Cover Pad	59	43248	Spacer, Crankshaft
31	48792	Pulley	60	48651	Fuel Tank (Includes Shut-off Valve)
32	48790	Pump Pulley	61	48311	Fuel Tank Cap
33	04063-01	Key, 1/4 x 1/4 x 1-1/4"	62	48568	Fuel Shut-off Valve
34	04041-07	Flatwasher, 3/8"			
35	*	Lockwasher, 3/8"			

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

BRAKE AND STEERING CONTROLS

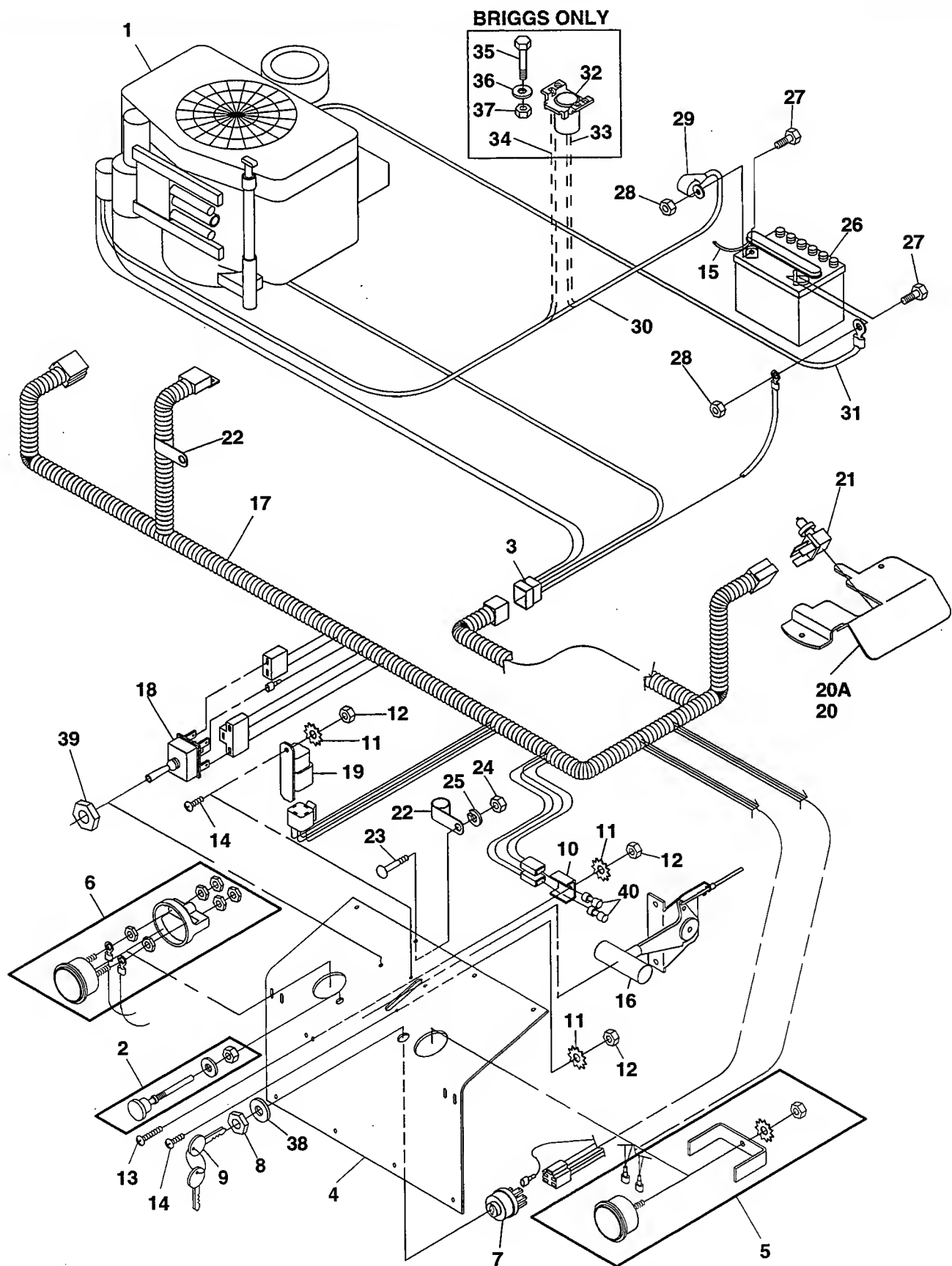


BRAKE AND STEERING CONTROLS

Ref. No.	Part Number	Description	Ref. No.	Part Number	Description
1	48827	Drive Wheel Assembly, Complete	29	45435	Control Lever, LH
2	48827-02	Tire Only	29A	45436	Control Lever, RH
3	48827-03	Rim Only	30	*	Hex Head Bolt, 5/16-18 x 1-1/2"
4	04028-01	Lug Nut, 1/2-20	31	*	Elastic Stop Nut, 5/16-18
5	48782	Axle, LH	32	421145	Bar Control Lever
5A	48783	Axle, RH	33	45437	Control Handle
6	48784	Pump, LH	34	48093	Grip, Control Handle
6A	48785	Pump, RH	35	*	Lockwasher, 3/8"
7	45464	Dump Valve, Lever Weldment	36	45482	Lever Weldment, Parking Brake
8	421212	Mounting Bracket	37	45483	Cam Weldment, Parking Brake
9	04062-01	Hair Pin	38	421262	Plate, Parking Brake
10	04001-95	Hex Head Bolt, 5/16-18 x 5"	39	421266	Latch, Brake
11	*	Flatwasher, 5/16"	40	43256	Swivel Joint
12	*	Lockwasher, 5/16"	41	44080	Rod, Brake
13	*	Hex Nut, 5/16-18	42	48840	Cable Assembly, Parking Brake
14	45462	Pump Weldment Shaft	43	421238	Plate, Coupler
15	421203	Clamp Plate	44	*	Hex Head Bolt, 1/4-20 x 3/4"
16	48829	Block, Pump Control	45	*	Lockwasher, 1/4"
17	48796	Bearing	46	*	Flatwasher, 1/4"
18	421204	Bearing Bracket	47	*	Hex Nut, 1/4-28
19	*	Hex Head Bolt, 3/8-16 x 1"	48	*	Hex Head Bolt, 1/4-20 x 1-1/4"
20	*	Elastic Stop Nut, 3/8-16	49	04060-06	Roll Pin, 3/16 x 3/4"
21	*	Hex Head Bolt, 3/8-16 x 1-1/2"	50	*	Hex Nut, 3/8-24
22	04041-07	Flatwasher, 3/8"	51	*	Hex Head Bolt, 3/8-16 x 2"
23	48544	Ball Joint, LH Thread	52	04041-12	Flatwasher, 3/8 x 1-1/2" x 16 ga.
24	43246	Link, Turnbuckle	53	48050	Spring, Brake Lever
25	48464	Ball Joint, RH Thread	54	*	Carriage Bolt, 3/8-16 x 1-1/2"
26	45460	Lever, Pump Transfer LH	55	*	Hex Nut, 3/8-16
26A	45461	Lever, Pump Transfer RH	56	*	Hex Head Bolt, 5/16-18 x 3/4"
27	48114-04	Grease Fitting	57	04062-02	Hair Pin, 1/16" diameter
28	48100-06	Bushing, LH	58	*	Elastic Stop Nut, 1/4-20
28A	48100-05	Bushing, RH	59	48342	Grip, Parking Brake

* Common hardware which should be purchased locally. All bolts Grade 5 plated, all other fasteners zinc plated.

INSTRUMENT PANEL AND ELECTRICAL COMPONENTS

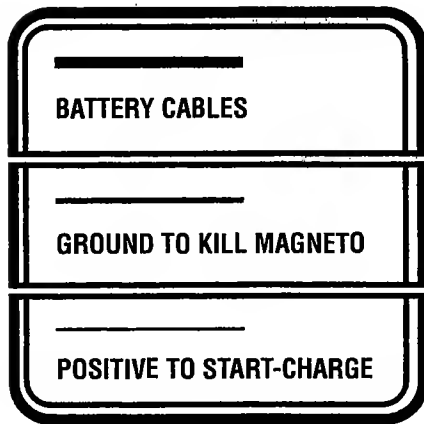
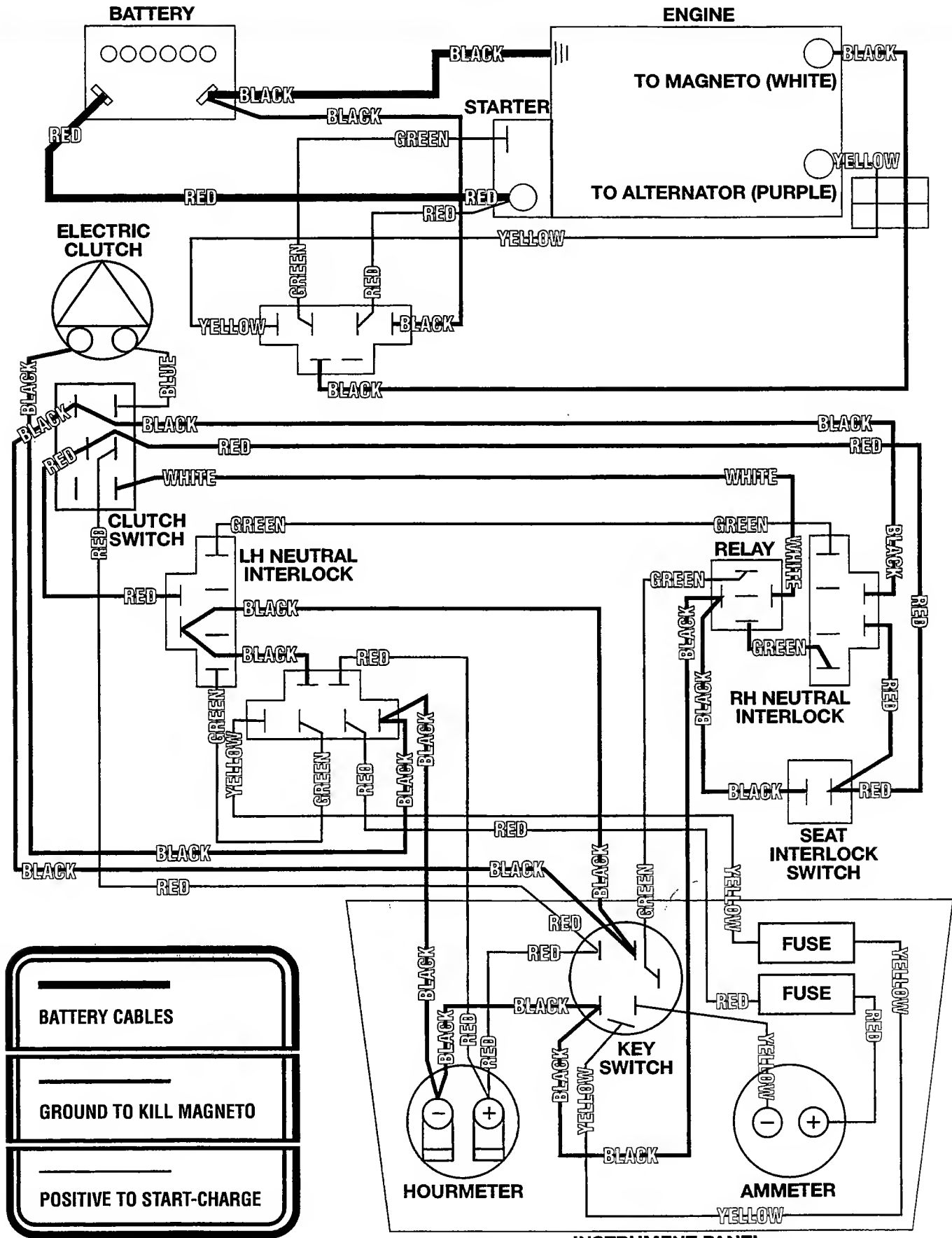


INSTRUMENT PANEL AND ELECTRICAL COMPONENTS

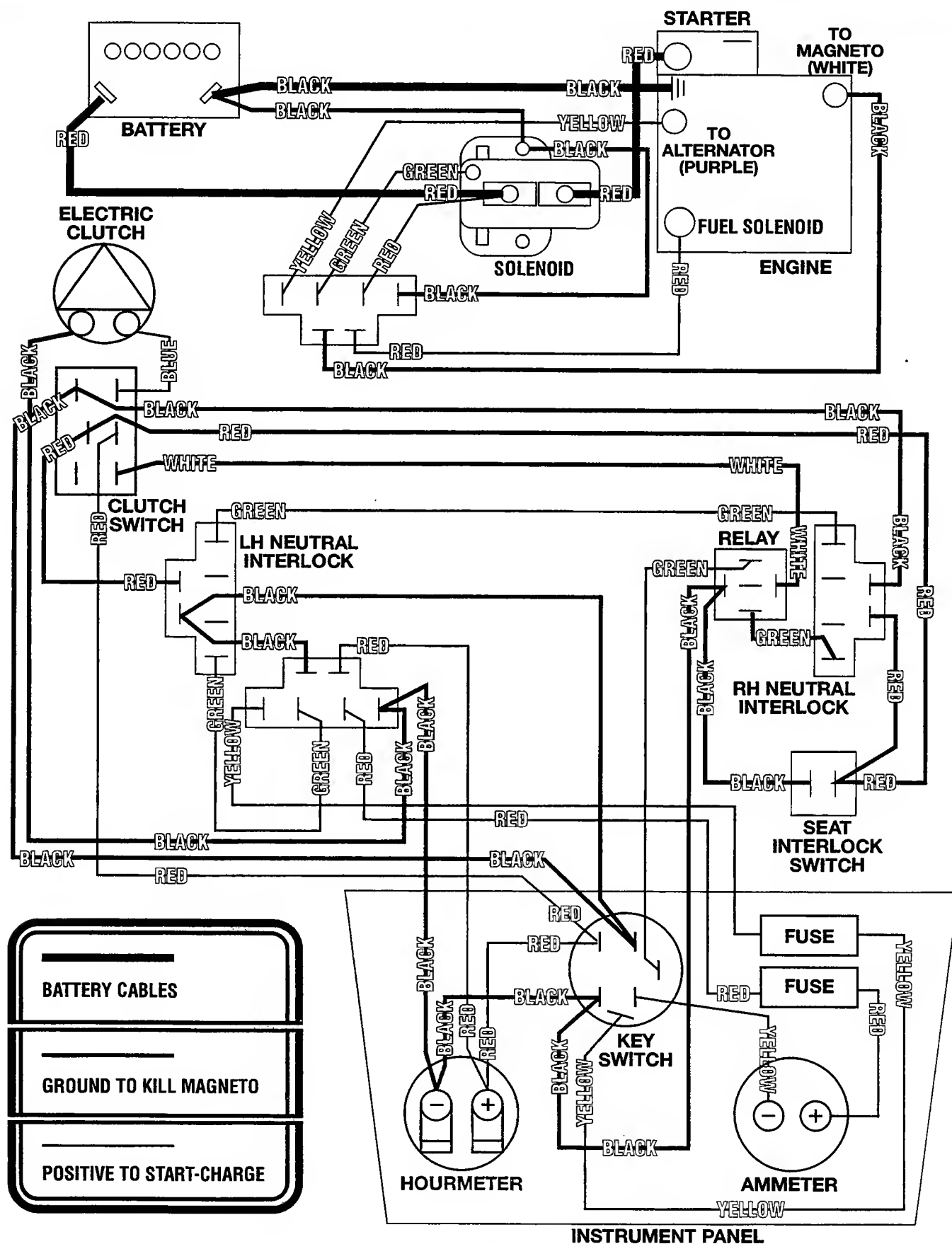
Ref. No.	Part Number	Description	16 BV	18 BV	18 KH
1	48766	Engine	X		
1	48768	Engine		X	
1	48812	Engine			X
2	48091	Choke Control	X	X	
2	48780	Choke Control			X
3	48800	Adapter			X
3	48801	Adapter	X	X	
4	421164	Kick Plate	X	X	X
5	48023	Hour Meter	X	X	X
6	48022	Ammeter	X	X	X
7	48798	Key Switch (Includes Mounting Hardware)	X	X	X
8	48017-04	Hex Nut, 5/8-32"	X	X	X
9	48017-02	Key & Ring Assembly	X	X	X
10	42413	Bracket, Fuse Holder	X	X	X
11	*	Lockwasher #10 External Tooth	X	X	X
12	*	Hex Nut #10-32	X	X	X
13	*	Screw, Phillips Washer Head #10-32 x 1-1/2"	X	X	X
14	*	Screw, Phillips Washer Head #10-32 x 1/2"	X	X	X
15	48015-01	Overflow Tube	X	X	X
16	48879	Throttle Control	X	X	X
17	48781	Wire Harness	X	X	X
18	48787	Switch, Mower Engagement	X	X	X
19	48788	Relay	X	X	X
20	421253	Neutral Lock Bracket, RH	X	X	X
20A	421252	Neutral Lock Bracket, LH	X	X	X
21	48522	Switch Neutral Lock	X	X	X
22	48030-09	Clamp	X	X	X
23	*	Carriage Bolt, 5/16-18 x 3/4"	X	X	X
24	*	Hex Nut, 5/16-18	X	X	X
25	*	Lockwasher, 5/16"	X	X	X
26	48015	Battery	X	X	X
27	*	Hex Head Bolt, 1/4-20 x 3/4"	X	X	X
28	*	Nut, 1/4-20	X	X	X
29	48126	Rubber Boot	X	X	X
30	48029-12	Battery Cable, 36" Red			X
31	48029-11	Battery Cable, 27" Black	X	X	X
32	48016	Solenoid	X	X	
33	48029-06	Battery Cable, 18" Red	X	X	
34	48029-03	Battery Cable, 13-3/4" Red	X	X	
35	*	Hex Head Bolt, 1/4-20 x 1"	X	X	X
36	*	Flatwasher, 1/4"	X	X	X
37	*	Elastic Stop Nut, 1/4-20	X	X	X
38	48017-03	Lockwasher, 5/8" Internal	X	X	X
39	48787-01	Hex Nut, 1/2-27	X	X	X
40	48298	Blade Type Fuse, 20 amp	X	X	X

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ELECTRICAL WIRING DIAGRAM - KOHLER



ELECTRICAL WIRING DIAGRAM - BRIGGS & STRATTON VANGUARD



REPLACEMENT DECALS



48556 – Size 12" x 3.25"



48859 – Size 11.5" x 5.5"



48623 – Size 12" x 3.25"



48318



48404



48825 – Size 8.5" x 2"

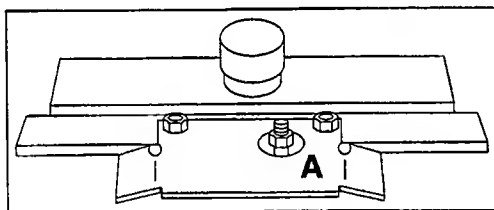


48072

IMPORTANT ADJUSTMENT PROCEDURES

READ OPERATOR'S MANUAL FOR MORE DETAILS

TRANSMISSION DRIVE BELT TENSION



To adjust transmission drive belt tension, tighten or loosen nut (A) on J-hook connected to transmission drive idler. Under proper tension, belt should move 1/4" with 10 pounds of pressure.

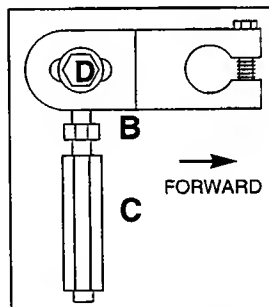
IMPORTANT!: If drive belt is too tight, pump or belt failure is likely to occur.

FREE WHEEL OPERATION

To move machine without running the engine, locate dump valve lever under fender in front of left drive wheel. Unhook and push forward to free wheel. Pull lever back and rehook for normal operation.

STRAIGHT-LINE RUNNING OR TRACKING ADJUSTMENT

Before making adjustment, be sure both drive tires are inflated equally. Loosen nut (D) on LH pump linkage. If machine pulls to right, move forward in slot to slow left wheel. If machine pulls to left, move rearward in slot to speed up left wheel. Readjust neutral if necessary.

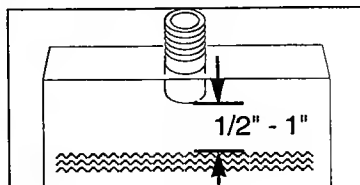


NEUTRAL ADJUSTMENT

Adjust neutral only with drive wheels elevated and machine blocked securely. Loosen jam nut (B) on the turnbuckle. If wheel rotates forward, adjust turnbuckle (C) clockwise. If wheel rotates rearward, adjust turnbuckle counter-clockwise. Adjust until drive wheel stops turning. Tighten jam nut.

HYDRAULIC FLUID LEVEL

Check hydraulic fluid level daily while fluid is cool. Fluid level should be 1/2" to 1" below bottom edge of fill sleeve. Fill with SAE 20W50 motor oil only.



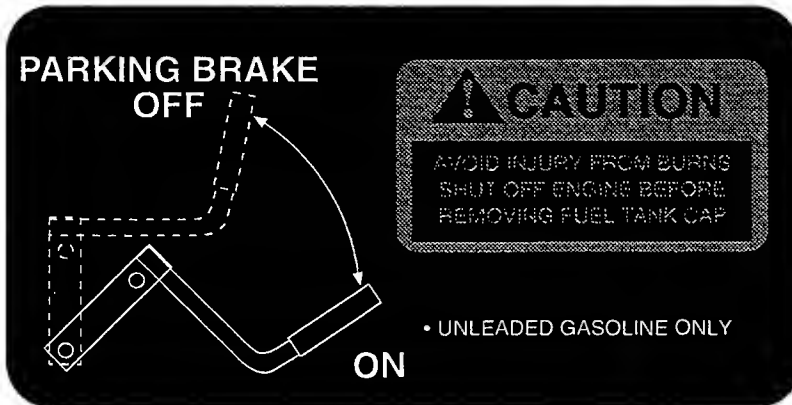
IMPORTANT!: Do Not overfill. Room for hot fluid expansion must be allowed or resulting expansion may cause leaks in the system.



WARNING

INSTALL BELT COVERS BEFORE OPERATING MACHINE
READ OPERATOR'S MANUAL

REPLACEMENT DECALS



48874



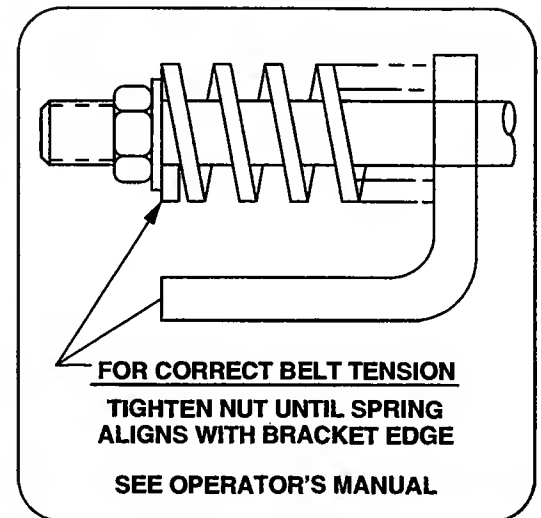
48712



48073



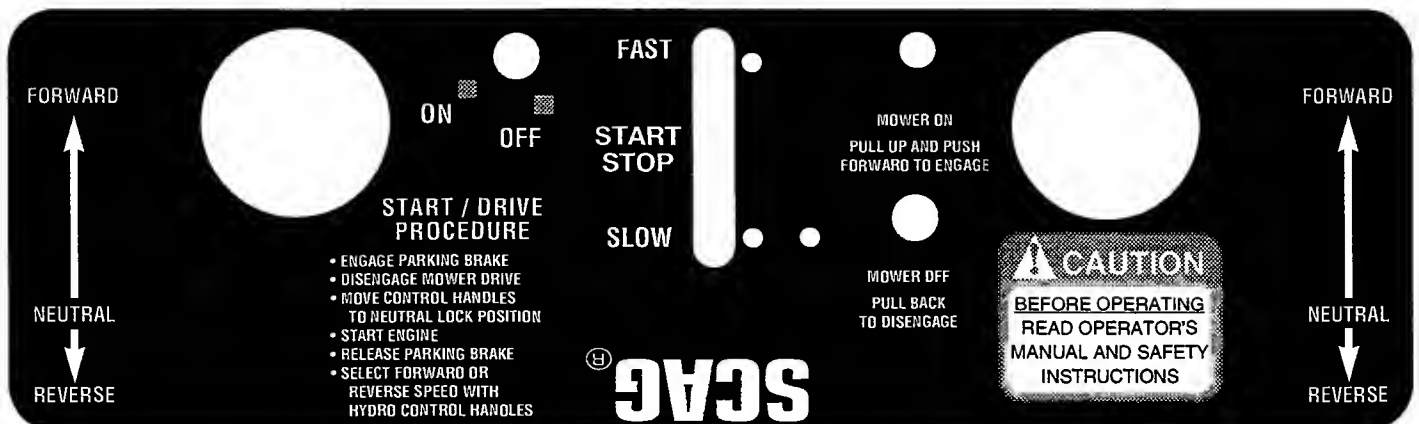
48071



48873



48715



48869

WARNING

If incorrectly used, this machine can cause severe injury. Those who use and maintain the machine should be trained in its proper use, warned of its dangers, and should read the entire manual before attempting to set up, operate, adjust or service the machine.

LIMITED WARRANTY-COMMERCIAL EQUIPMENT

Any part of the Scag commercial mower manufactured by Scag and found, in the reasonable judgment of Scag, to be defective in materials or workmanship, will be repaired or replaced by an Authorized Scag Service Dealer without charge for parts and labor. This warranty is limited to the original purchaser and is not transferable. Proof of purchase will be required by the dealer to substantiate any warranty claims. All warranty work must be performed by an Authorized Scag Service Dealer.

This warranty is limited to the following specified periods from the date of the original purchase for defects in materials or workmanship:

- * Frame, deck and structural components including oil reservoirs - 1 year.
- * Wear items including drive belts, blades, hoses and tires are warranted for 90 days.
- * Engines and electric starters are covered by the manufacturer's warranty period.
- * Drive system components are covered by the manufacturer's warranty period.
(Excluding fittings, hoses, cooling system, oil reservoir, drive belts). Drive systems are warranted by Scag Power Equipment in conjunction with the component manufacturer.
- * Batteries are covered for 1 year.
- * Any Scag product used for rental purposes is covered for 90 days.

The Scag mower including any defective part, must be returned to an Authorized Scag Service Dealer within the warranty period. The expense of delivering the mower to the dealer for warranty work and the expense of returning it to the owner after repair will be paid for by the owner. Scag's responsibility is limited to making the required repairs, and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any Scag mower.

This warranty does not cover any mower that has been subject to misuse, neglect, negligence, or accident, or that has been operated in any way contrary to the operating instructions as specified in the Technical Manual. The warranty does not apply to any damage to the mower that is the result of improper maintenance, or to any mower or parts that have not been assembled or installed as specified in the Technical Manual. The warranty does not cover any mower that has been altered or modified changing performance or durability. In addition, the warranty does not extend to repairs made necessary by normal wear, or by the use of parts or accessories which, in the reasonable judgment of Scag, are either incompatible with the Scag mower or adversely affect its operation, performance or durability.

Scag Power Equipment reserves the right to change or improve the design of any mower without assuming any obligation to modify any mower previously manufactured.

All other implied warranties are limited in duration to the one (1) year warranty period or ninety (90) days for mowers used for rental purpose. Accordingly, any such implied warranties including merchantability, fitness for a particular purpose, or otherwise, are disclaimed in their entirety after the expiration of the appropriate one-year or ninety day warranty period. Scag's obligation under this warranty is strictly and exclusively limited to the repair or replacement of defective parts and Scag does not assume or authorize anyone to assume for them any other obligation. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Scag assumes no responsibility for incidental, consequential or other damages including, but not limited to, expense for gasoline, expense of delivering the mower to an Authorized Scag Service Dealer and expense of returning it to the owner, mechanic's travel time, telephone or telegram charges, rental of a like product during the time warranty repairs are being performed, travel, loss or damage to personal property, loss of revenue, loss of use of the mower, loss of time, or inconvenience. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

PLEASE BE CAREFUL

1. Keep all shields in place, especially grass discharge.
2. Stop machine and remove spark plug wire to adjust or service.
3. When mechanism becomes clogged, stop engine before cleaning.
4. Keep hands, feet and clothing away from power-drive parts.
5. Keep off implement unless seat or platform is provided.
6. Keep others off.

**FAILURE TO FOLLOW CAUTIOUS OPERATING PRACTICES MAY RESULT
IN SERIOUS BODILY INJURY. WE WANT YOU TO CONTINUE TO ENJOY
AND PROFIT BY USING OUR PRODUCTS.**

OWNER REFERENCE

MODEL NUMBER _____

SERIAL NUMBER _____

ENGINE MODEL _____

SERIAL NUMBER _____